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EXAMINER	
BROCK II, PAUL E	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/648,111	HWANG, KWANG-JO	
	Examiner	Art Unit	
	Paul E. Brock II	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 August 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5 – 9, 11, 13, 15, 16, 20 – 22, 24 and 28 – 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano et al. (USPAT 5771110, Hirano) in view of Chen (USPAT 6133145).

Hirano discloses in figures 1 – 16 a method of manufacturing a liquid crystal display device.

With regard to claim 1, Hirano discloses in figures 1 - 8 forming a switching element (2 - 7) on a substrate (1). Hirano discloses in figure 13 forming a passivation layer (14) over the substrate. Hirano discloses in figure 14 depositing a metal layer (16) on the passivation layer. Hirano discloses in column 12, lines 54 - 60 forming a photoresist pattern on a surface of the metal layer, such that an upper portion of the metal layer is exposed. Hirano discloses in figure 15 and column 12, lines 54 - 60 etching a portion of the metal layer to form a pixel electrode. Hirano does not teach treating the exposed portion of the metal layer with a first plasma, prior to etching. Chen teaches in figures 5 and 6 and column 4, lines 16 - 24 treating an exposed portion of a metal layer (10a) with a first plasma (a plasma treatment in a nitrogen ambient, col. 4, lines

20 - 24), prior to any step of etching a photoresist pattern (12b), and prior to any step of etching the metal layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the treating method of Chen in the method of Hirano in order to slow the removal rate of the resist pattern by causing the resist pattern to become more resilient as taught by Chen in column 1, lines 29 - 35 and column 4, lines 17 - 24. This slowed removal rate of the resist will ensure the integrity of the metal etch during the entire etch cycle allowing narrower metal electrodes to be defined. Further, "thereby lowering an internal binding force in the exposed portion of the metal layer" is an intended use recitation that does not define a manipulative difference between the combination of Hirano and Chen with the claimed invention because net result of the etch treatment of Chen, when performed during the invention of Hirano, would thereby lower an internal binding force in the exposed portion of the metal layer of Hirano. Lowering an internal binding force in the exposed portion of the metal layer to increase a subsequent etch rate of the metal layer is a necessary result of using the plasma treatment of Chen in the method of Hirano. The combination of Hirano and Chen teaches wherein the depositing a metal layer on the passivation layer, forming a photoresist pattern, and treating the exposed portion of the metal layer are sequentially performed.

With regard to claim 2, Hirano discloses in column 11, line 63 wherein the switching element is a thin film transistor.

With regard to claim 5, Chen teaches in figure 5 and column 4, lines 16 – 24 using a non-reactive gas to lower a binding force in the exposed portion.

With regard to claim 6, Chen discloses in figure 5 and column 4, lines 16 – 24 wherein the non-reactive gas includes N_2.

With regard to claim 7, Hirano discloses in column 12, lines 54 – 60 the step of etching the metal layer involves a dry-etching technique.

With regard to claim 8, Hirano discloses in column 12, lines 54 – 60 the step of etching the metal layer includes etching the metal layer with HBr plasma gas.

With regard to claim 9, Hirano discloses in column 12, lines 54 – 60 the step of etching the metal layer includes etching the metal layer with a composition of HBr plasma gas and Cl_2 plasma gas.

With regard to claim 11, Hirano discloses in column 12, lines 48 – 60 the metal layer is indium tin oxide (ITO).

With regard to claim 13, Chen discloses in figure 5 and column 4, lines 16 – 24 wherein the first gas is a reactive gas.

With regard to claim 15, Chen teaches in figure 5 and column 4, lines 16 – 24 wherein the first gas is a non-reactive gas.

With regard to claim 16, Chen discloses in figure 5 and column 4, lines 16 – 24 wherein the non-reactive gas includes N_2.

With regard to claim 20, Hirano discloses in column 12, lines 48 – 60 wherein the metal layer is indium tin oxide (ITO).

With regard to claim 21, Hirano discloses in figure 15 removing the photoresist pattern from the pixel electrode.

With regard to claim 22, Hirano discloses in figure 14, depositing a metal layer (16) over a substrate (1). Hirano discloses in column 12, lines 54 – 60 forming a mask on a surface of the metal layer, leaving an upper portion of the metal layer uncovered. Hirano discloses in column

12, lines 57 – 60 etching the uncovered portion of the metal layer with a second plasma to form a metal pattern. Hirano does not teach exposing the uncovered portion of the metal layer to a first plasma. Chen teaches in figure 5 and column 4, lines 13 – 24 exposing an uncovered portion of a metal layer (10a) to a first plasma (a plasma treatment in a nitrogen ambient, col. 4, lines 20 – 24) prior to any step of etching the metal layer, thereby lowering an internal binding force in the uncovered portion. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the exposing method of Chen in the method of Hirano in order to slow the removal rate of the resist pattern by causing the resist pattern to become more resilient as taught by Chen in column 1, lines 29 - 35 and column 4, lines 17 - 24. This slowed removal rate of the resist will ensure the integrity of the metal etch during the entire etch cycle allowing narrower metal electrodes to be defined. Further, "thereby lowering an internal binding force in the exposed portion of the metal layer" is an intended use recitation that does not define a manipulative difference between the combination of Hirano and Chen with the claimed invention because net result of the etch treatment of Chen, when performed during the invention of Hirano, would thereby lower an internal binding force in the exposed portion of the metal layer. Lowering an internal binding force in the uncovered portion of the metal layer to increase a subsequent etch rate of the metal layer is a necessary result of using the plasma treatment of Chen in the method of Hirano. The combination of Hirano and Chen teaches wherein the depositing a metal layer over a substrate, forming a mask on a surface of the metal layer, and exposing the uncovered portion of the metal layer are sequentially performed.

With regard to claim 24, Chen teaches in figure 5 and column 4, lines 13 – 24 wherein the first plasma includes N_2.

With regard to claim 28, Hirano discloses in column 12, lines 48 – 60 the metal layer is indium tin oxide (ITO).

With regard to claim 29, Hirano discloses in figure 15 that the metal pattern includes a pixel electrode of a display device.

With regard to claim 30, Hirano discloses in figure 14 depositing a metal layer (16) on a passivation layer (14) which partially covers a transistor (2 – 7). Hirano discloses in column 12, lines 48 – 60 forming a photoresist pattern on a surface of the metal layer, leaving an upper portion of the metal layer uncovered. Hirano discloses in column 12, lines 57 – 60 etching the uncovered portion of the metal layer with a second plasma to form a pixel electrode. Hirano does not teach exposing the uncovered portion of the metal layer to a first plasma, prior to etching. Chen teaches in figure 5 and column 4, lines 16 – 24 exposing an uncovered portion of a metal layer (10a) to at least one first gas (a plasma treatment in a nitrogen ambient, col. 4, lines 20 – 24), prior to any step of etching a photoresist pattern (12b) and prior to any step of etching the metal layer to lower an internal binding force in the uncovered portion. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the exposing method of Chen in the method of Hirano in order to slow the removal rate of the resist pattern by causing the resist pattern to become more resilient as taught by Chen in column 1, lines 29 - 35 and column 4, lines 17 - 24. This slowed removal rate of the resist will ensure the integrity of the metal etch during the entire etch cycle allowing narrower metal electrodes to be defined. Further, "to lower an internal binding force in the exposed portion of the metal layer" is an intended use recitation that does not define a manipulative difference between the combination of Hirano and Chen with the claimed invention because net result of the etch treatment of Chen,

when performed during the invention of Hirano, would be to lower an internal binding force in the exposed portion of the metal layer. Lowering an internal binding force in the uncovered portion of the metal layer to increase a subsequent etch rate of the metal layer is a necessary result of using the plasma treatment of Chen in the method of Hirano. The combination of Hirano and Chen teaches wherein the depositing a metal layer on the passivation layer, forming a photoresist pattern, and exposing the uncovered portion of the metal layer are sequentially performed.

With regard to claim 31, Hirano discloses in figure 14 depositing a metal layer (16) on a passivation layer (14) which partially covers a transistor (2 – 7). Hirano discloses in column 12, lines 48 – 60 forming a photoresist pattern on a surface of the metal layer, leaving an upper portion of the metal layer uncovered. Hirano discloses in column 12, lines 57 – 60 etching the uncovered portion of the metal layer with a second plasma to form a pixel electrode. Hirano does not teach exposing the uncovered portion of the metal layer to a first plasma, prior to etching. Chen teaches in figure 5 and column 4, lines 16 – 24 exposing an exposed portion of a metal layer (10a) to at least one first gas (a plasma treatment in a nitrogen ambient, col. 4, lines 20 – 24), prior to any step of etching, to lower an internal binding force in the uncovered portion. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the exposing method of Chen in the method of Hirano in order to slow the removal rate of the resist pattern by causing the resist pattern to become more resilient as taught by Chen in column 1, lines 29 - 35 and column 4, lines 17 - 24. This slowed removal rate of the resist will ensure the integrity of the metal etch during the entire etch cycle allowing narrower metal electrodes to be defined. Further, "to lower an internal binding force in the exposed portion of

the metal layer" is an intended use recitation that does not define a manipulative difference between the combination of Hirano and Chen with the claimed invention because net result of the etch treatment of Chen, when performed during the invention of Hirano, would be to lower an internal binding force in the exposed portion of the metal layer. With regard to claim 30, Hirano discloses in figure 14 depositing a metal layer (16) on a passivation layer (14) which partially covers a transistor (2 – 7). Hirano discloses in column 12, lines 48 – 60 forming a photoresist pattern on a surface of the metal layer, leaving a portion of the metal layer uncovered. Hirano discloses in column 12, lines 57 – 60 etching the uncovered portion of the metal layer with a second plasma to form a pixel electrode. Hirano does not teach exposing the uncovered portion of the metal layer to a first plasma, prior to etching. Chen teaches in figure 5 and column 4, lines 16 – 24 exposing an uncovered portion of a metal layer (10a) to at least one first gas (a plasma treatment in a nitrogen ambient, col. 4, lines 20 – 24), prior to any step of etching a photoresist pattern (12b) and prior to any step of etching the metal layer to lower an internal binding force in the uncovered portion. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the exposing method of Chen in the method of Hirano in order to slow the removal rate of the resist pattern by causing the resist pattern to become more resilient as taught by Chen in column 1, lines 29 - 35 and column 4, lines 17 - 24. This slowed removal rate of the resist will ensure the integrity of the metal etch during the entire etch cycle allowing narrower metal electrodes to be defined. Further, "to lower an internal binding force in the exposed portion of the metal layer" is an intended use recitation that does not define a manipulative difference between the combination of Hirano and Chen with the claimed invention because net result of the etch treatment of Chen, when performed during the

invention of Hirano, would be to lower an internal binding force in the exposed portion of the metal layer. Lowering an internal binding force in the uncovered portion of the metal layer to increase a subsequent etch rate of the metal layer is a necessary result of using the plasma treatment of Chen in the method of Hirano. The combination of Hirano and Chen teaches wherein the depositing a metal layer on the passivation layer, forming a photoresist pattern, and exposing the uncovered portion of the metal layer are sequentially performed.

3. Claims 10, 17 – 19, and 25 – 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano and Chen as applied to claims 1, 7, 22 and 30 respectively, above, and further in view of Ye et al. (USPAT 5968847, Ye).

With regard to claim 10, Hirano and Chen do not disclose the combination of HBr and CH_4 as plasma gasses. Ye teaches in column 12, lines 55 – 62 that a composition of HBr and CH_4 can be used for etching a metal layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the composition of HBr and CH_4 for etching a metal layer because both are well known etching gasses that are readily available in a production fabrication facility.

With regard to claims 17 and 18, Hirano discloses at least one second gas that includes Cl_2. Hirano and Chen do not disclose that the at least one second gas includes an HBr plasma gas. Ye teaches in column 5, lines 15 – 20 at least one second gas that includes an HBr plasma gas. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the HBr plasma gas of Ye as an additional gas with Cl_2 in the second etch step

of Hirano and Chen for etching a metal layer in order to enhance the etching properties of the plasma by creating a more diverse reactive plasma gas.

With regard to claims 25 and 26, Hirano discloses a second plasma gas that includes Cl_2. Hirano and Chen do not disclose that the second plasma gas includes an HBr plasma gas. Ye teaches in column 5, lines 15 – 20 a plasma that includes both HBr and Cl_2 for removing a metal layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the HBr plasma gas of Ye as an additional gas with Cl_2 in the second etch step of Hirano and Chen for etching a metal layer in order to enhance the etching properties of the plasma by creating a more diverse reactive plasma gas.

With regard to claim 19, Hirano discloses at least one second gas that includes Cl_2. Hirano and Chen do not teach the use of HBr and CH_4 as etching gasses. Ye discloses in column 5, lines 15 – 20 the use of HBr and CH_4 in the same metal etch step that just Cl_2 is used. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the combination of HBr and CH_4 of Ye as a substitute gas for Cl_2 of Hirano and Chen in the second etching step in order to enhance the etching properties of the plasma by creating a more diverse reactive plasma gas.

With regard to claim 27, Hirano discloses the use of Cl_2 for the second etching step. Hirano and Chen do not teach the use of HBr and CH_4 as etching gasses. Ye discloses in column 5, lines 15 – 20 the use of HBr and CH_4 in the same metal etch step that just Cl_2 is used in. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the combination of HBr and CH_4 of Ye as a substitute gas for Cl_2 of Hirano and Chen in the

second etching step in order to enhance the etching properties of the plasma by creating a more diverse reactive plasma gas.

4. Claims 3, 4, 14, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirano and Chen as applied to claims 1, 13, 22 and 30, respectively, above, and further in view of Muraguchi et al. (JPPAT 361002368, Muraguchi).

With regard to claim 3, Hirano and Chen do not teach the step of treating the exposed portion of the metal layers includes using a reactive gas. Muraguchi teaches in the Constitution using a reactive gas in a step of treating an exposed portion of a metal layer to lower a binding force in the exposed portion. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the reactive gas of Muraguchi in the method of Hirano and Chen in order to reduce oxygen atoms without resulting in crystal damage to the surface.

With regard to claims 4 and 14, Muraguchi discloses that the reactive gas is H_2.

With regard to claim 23, for the same reasons as stated above with regard to claims 3, 4 and 14 it would have been obvious to use the H_2 plasma gas of Mohri in the first plasma of Hirano.

Response to Arguments

5. Applicant's arguments filed June 15, 2004 have been fully considered but they are not persuasive.

6. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Hirano is used to teach everything but the plasma treatment while Chen is used for the plasma treatment. The combination must be evaluated in order to determine the net effect of the plasma treatment on the metal layer. This evaluation can be found in the above paragraph. Therefore, applicant's arguments are not persuasive, and the rejection is proper.

Response to Arguments

7. Applicant's arguments filed December 3, 2004 have been fully considered but they are not persuasive.

8. With regard to applicant's argument that the newly amended recitation "'lowering' in place of 'to lower'" eliminates "the Examiner's asserted 'intended use' recitation," it should be noted that this amendment merely states the same intended use by way of a different phrase. Both the old "to lower" clause and the new "lowering" clause both define the intended use of decreasing "an internal binding force in the exposed portion of the metal layer." Therefore applicant's arguments are not persuasive and the rejection is proper.

9. In response to applicant's argument that the claim recitation "thereby lowering an internal binding force in the exposed portion of the metal layer to increase a subsequent etch rate of said

metal layer" is not intended use, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Therefore applicant's arguments are not persuasive and the rejection is proper.

10. With regard to applicant's argument that "based on the assumption (*in arguendo*) that the methods are the same, then the Applicant has obtained an unexpected result," it should be noted that the result of Chen is to allow thinner photoresist shapes to be used (see the last four lines of the abstract). While Chen focuses on the "increased etch ratio" after the plasma treatment, and specifically points to the decreased etch rate of the photoresist shape, nothing in Chen precludes an ordinary artesian to think an increased etch rate of the underlying metal would be an "unexpected result". An increased etch rate of the underlying metal in Chen would yield, and add too, the very much expected result of an "increased etch ratio" between the metal and photoresist. In other words, the identical treatments of Chen and the claimed invention both increase the etch ratio of the metal to the photoresist. The fact that Chen focuses on the result of the photoresist etch rate and the claimed invention focuses on the result of the metal etch rate does not mean that the photoresist in the claimed invention and the metal in Chen are not affected by the identical treatments discussed by both. Instead, the ordinary artesian would recognize that an increased metal etch rate in Chen would be consistent with Chen's main

observation of an increased etch rate selectivity. Further, the ordinary artesian would recognize the decreased etch rate of the photoresist of Chen would further the applicant's claimed invention. While ignoring either result from the identical plasma treatments of the claimed invention and Chen might appear to show unexpected results, a realization of the consistent nature pointed out above indicates that Chen was only concerned with the effect on the photoresist and did not determine the absolute affect on the metal etch rate. Therefore applicant's arguments are not persuasive and the rejection is proper.

11. With regard to applicant's arguments that "Based on this sequence of Chen, it is apparent that the Applicant's claimed method and the method of Chen are not the same. That is, in Chen, the photoresist pattern and the metal layer are exposed to a plasma twice before the final etch cycle," it should be noted that the sequence of Chen and that of the claimed invention is very much the same. The extra steps of Chen does not destroy the sequence of Chen depositing the metal layer, forming a photoresist pattern, treating the exposed portion of the metal layer, and etching the treated portion. Instead, the sequence of Chen merely has an extra etching step. Sequentially claiming steps does not rule out the presence of intermediate steps. Instead it can be seen that applicant must have intermediate steps too. Intermediate steps that are could be present in applicant's invention include measurement steps, transportation steps, cleaning steps, stabilization steps, etc. None of these are claimed, but depositing the metal layer, forming a photoresist pattern, treating the exposed portion of the metal layer, and etching the treated portion are still sequential. Sequential steps may have intermediate steps. Therefore, applicant's arguments are not persuasive and the rejection is proper.

12. With regard to applicant's argument that "Chen does not teach (or suggest) that an *etch rate* of the metal layer is increased at all. Chen actually teaches away from such a result," it should be noted that Chen in column 1, lines 32 – 35 does teach "maintaining the desired removal rate of the exposed metal," however, this does not support the "teaches away" argument. Nowhere in Chen does is an increased etch rate of the metal noted to be deleterious to the primary purpose of the invention. Chen is primarily concerned with increasing "the etch rate ratio between metal and an overlying masking photoresist shape" (column 2, lines 49 – 54). While the primary way of accomplishing this as taught by Chen is to decrease the etch rate of the photoresist, it is equally possible to accomplish the same result by increasing the etch rate of the metal, or both. Thus, increasing the etch rate of the metal would accomplish the desired result of Chen, and better yet, if both the metal etch rate is increased and the photoresist etch rate is decreased, the desired result of Chen to increase the etch rate ratio between metal and an overlying photoresist could be accomplished even more effectively. Further, looking at the metal material of the combination, one of ordinary skill in the art would note that the application of the plasma treatment of Chen in the method of Hirano would be performed on ITO metal. A plasma treated ITO metal layer in the combination would have the claimed properties. Therefore, applicant's arguments are not persuasive, and the rejection is proper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E. Brock II whose telephone number is (571) 272-1723. The examiner can normally be reached on 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul E Brock II

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